Operationally Responsive Spacelift (ORS)

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Operationally Responsive Spacelift

ORS supports all mission areas

- Force Application
- Force Enhancement
- Space Support
- Counterspace

Key element is "Responsiveness"

- Goal is Hours to Days vs. Weeks to Months to launch

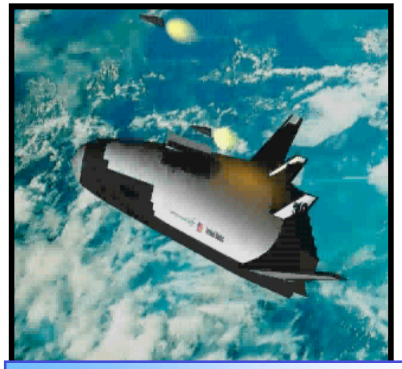
Requires responsive payloads to support warfighter

Launch, Maneuver, Service, and Retrieve space payloads to enhance military effectiveness

ORS Mission Needs Statement (MNS) Summary

- On-Demand ISR
  - Pre-Strike Planning
  - BDA
  - Sensor-to-Shooter
  - Flexible Constellation
  - Unpredictable Orbits
- Ground & Marine Sensors

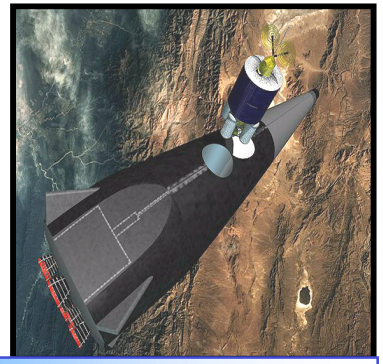
Force Enhancement



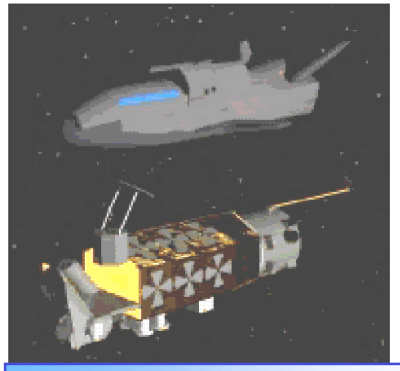
Force Application

- Global Precision Strike
  - Common Aero Vehicle (CAV) Flexible Weapon Carrier
  - Centers of Gravity
  - HDBT Defeat
  - WMD Defeat
- CONUS Based
  - Time-to-Tgt < 120 min

- Cost Effective Lift
- Launch on Demand
- Launch to Sustain
- Recover Space Assets
- On-Orbit Servicing
- Support ACTDs & Testing



Space Support



Counterspace

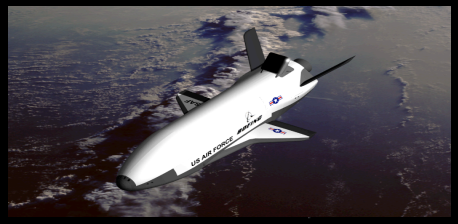
- Defensive Counterspace
  - Satellite Protection
- Offensive Counterspace
- Space Surveillance
  - Space Object ID
  - SMV Fly-bys

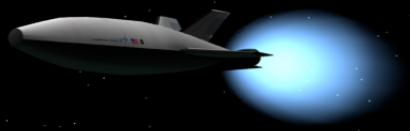
ORS MNS Cuts Across all Mission Areas

Notional Operationally Responsive Spacelift (ORS) System

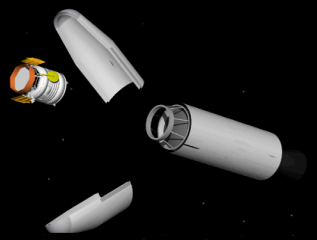
Space Operations Vehicle (SOV)
Reusable Launch System

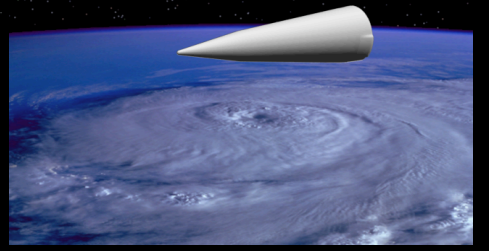
Space Maneuver Vehicle (SMV)
Reusable On-Orbit Ops Platform, Satellite Bus and Upper Stage





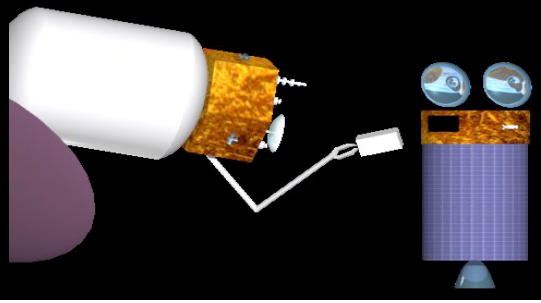
Modular Insertion Stage (MIS)
Low Cost Expendable Upper Stage



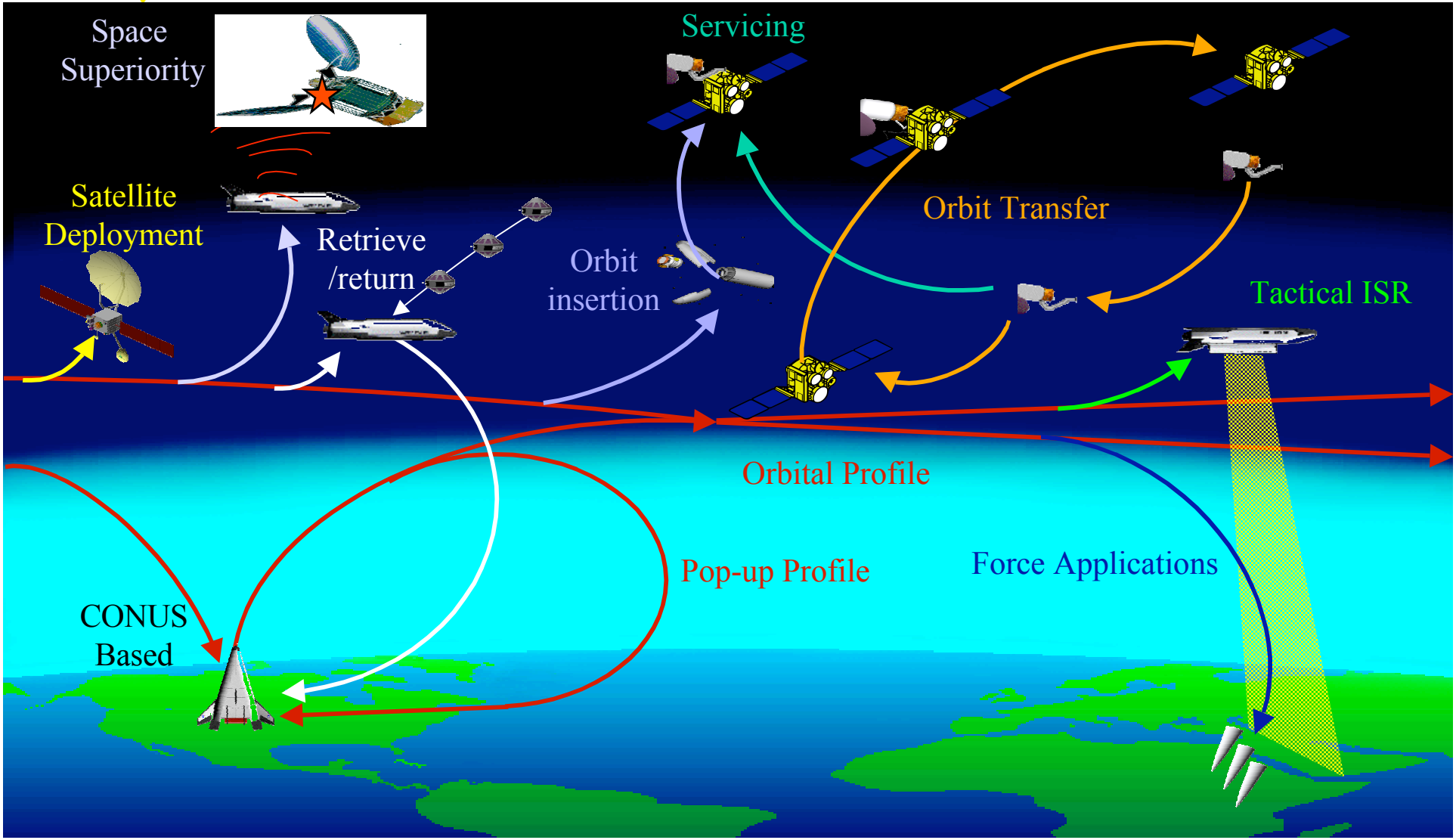


Common Aero Vehicle (CAV)

Orbit Transfer Vehicle (OTV)
Notional Concept for On-Orbit Servicing (OOS) and Transfer



AFSPC Notional Operational View

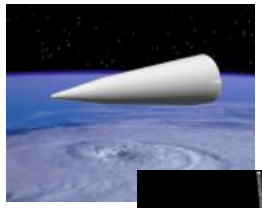
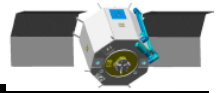
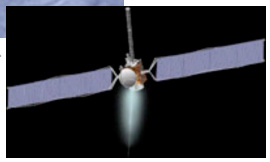


AoA Scope

- All Lift options – Expendable, Reusable and Hybrid
- Notional payloads – Common Aero Vehicle (CAV) Navigation, Intelligence Surveillance and Reconnaissance (ISR), Offensive Counterspace (OCS), Defensive Counterspace (DCS)
- Life Cycle Cost (LCC) for the system – Ground, Lift, Payload

Not all pieces done equally: Emphasis on launch. Maneuver, service and retrieve determined indirectly through military utility

National Objectives for Space Launch

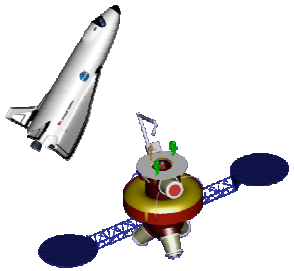




Common Spacelift Objectives

- Responsive, reliable, affordable light spacelift
  - 1-6klb class to LEO
- Responsive, reliable, affordable medium/intermediate spacelift
  - 10-25klb class to LEO
- Responsive, reliable, affordable heavy spacelift
  - 40-50klb class capability
- Reliable, affordable very heavy spacelift
  - 90-220klb class capability

NASA Specific Desires

- Small Earth and space science robotic exploration (1 - 20klb/9mT class)
- Large Earth and space science robotic exploration (40 - 50klb/23mT class)
- Exploration missions to Earth's neighborhood in the 2015 timeframe (90klb/40mT 27'X100')
- Exploration missions to the planets in the 2020 and beyond timeframe (220klb/100mT class)
- Cargo to ISS (~80klb/year of logistics post assembly)
- Human transportation to and from space (OSP/EELV initial capability)



USAF Specific Desires

- Replace Russian Engine (RD180 to 1Mlbf LOX/HC) in 2010+ timeframe
- Common Aero Vehicle (CAV - up to 2500 lb)
  - Single by 2009 / Multiple by 2012-14
- MicroSat class satellites
- Responsive within the ATO Cycle satellites (1 - 10klb class)
- On-schedule satellites (50 - 100klb class)

Leveraging NAI, NGLT, and AF Efforts

- National Aerospace Initiative (NAI)
  - AFSPC and SMC participating in Synergy Working Group
  - Initial NAI Access to Space Roadmap developed from AF-NASA 120-day study
  - AFSPC and SMC participated in NAI-NGLT Access to Space Roadmap updated - Feb 03
  - Access to Space Roadmap will incorporate ORS AoA data – Sep 03
- NASA NGLT team supporting ORS AoA
  - Developing deployment scenarios, supporting spacelift options definition, fleet size & cost analysis, risk analysis and technology milestones
- Goddard & NRO being asked to participate in responsive payload study